

WHAT IS CLAIMED IS:

1. A coating system comprising
- I) an anhydrous, gel-like, high molecular weight polyurethane composition, which may contain an active substance, comprising
- 5 (1) 15 to 62 wt.%, based on the weight of 1) and 2), of a high molecular weight covalently crosslinked polyurethane matrix,
- (2) 38 to 85 wt.%, based on the weight of 1) and 2), of a liquid dispersing agent firmly bound in the matrix by secondary valence bonds, wherein the liquid dispersing agent contains one or more
- 10 polyhydroxyl compounds having a number average molecular weight of 1000 to 12000 and an OH number of 20 to 112, wherein the dispersing agent is substantially free from hydroxyl compounds having a molecular weight below 800 and
- (3) optionally 0.1 to 100 wt.%, based on the weight of 1) and 2), of
- 15 fillers, additives and/or catalysts for the polyurethane-forming reaction, wherein optionally 0.1 to 50 wt.% of the additives are active substances, and
- II) a solvent-containing, solvent-free and/or aqueous polyurethane topcoat comprising
- 20 a) 0 to 100 wt.%, based on the total weight of the topcoat, of a polyurethane adduct,
- b) 0 to 90 wt.%, based on the total weight of the topcoat, of a flexible polyol having a T_g of -100 to 70°C and an OH content of 0 to 25 wt.%, based on the total weight of the flexible polyol and
- 25 c) 0 to 60 wt.%, based on the total weight of the topcoat, of a polyisocyanate having an NCO content of 4 to 50 wt.%.
2. The coating system of Claim 1 wherein polyurethane composition I) contains 20 to 57 wt.% of polyurethane matrix 1) and 43 to 80 wt.% of liquid dispersing agent 2) and polyurethane matrix comprises
- 30 the reaction product of one or more polyisocyanates and one or more polyhydroxyl compounds with a number average molecular weight of 1000

to 12000 and an OH number between 20 and 112, wherein the mathematical product of the NCO functionality of the polyisocyanates and OH functionality of the polyhydroxyl compounds is at least 5.2.

3. The coating system of Claim 1 wherein liquid dispersing agent 2) comprises one or more polyhydroxyl compounds with a number average molecular weight of 1700 to 6000 and an OH number of 28 to 84.

4. The coating system of Claim 1 wherein component 3) contains an active substances comprising a member selected from the group consisting of biocides, fragrances, colorants, detergents and washing aids, marking inks and printing inks, anti-aging agents, lubricants and antistatics, cleaning and care agents, anti-fouling agents, wood protection agents, plant nutrients, preservatives and growth regulators.

5. The coating system of Claim 1 wherein the polyurethane topcoat II) comprises the reaction product of a flexible polyol b) with a Tg of 100 to 25°C and an OH content of 0 to 25 wt.% with a polyisocyanate c) and optionally contains up to 50 wt.%, based on the total weight of the topcoat, of a non-crosslinking polyurethane adduct a).

6. The coating system of Claim 1 wherein polyisocyanate c) is present in an amount of up to 40%, based on the total weight of the topcoat.

7. The coating system of Claim 1 wherein flexible polyol IIb) is mixed with a polyacrylate.

8. A multilayer coating produced from the coating system of Claim 1 wherein the polyurethane matrix has a layer thickness of 30 μm to 10 mm and the polyurethane topcoat has a layer thickness of 5 μm to 2 mm.

9. A process for producing the multilayer coating of Claim 8 which comprises

- a) adding the polyurethane matrix to a mold by knife coating, pouring, spraying or injecting,
- b) applying the topcoat by knife coating, pouring, spraying or injecting,

- c) wherein a) and b) may be varied as follows as regards order
- i) applying the topcoat to the mold wall and then adding the primer and reacting in a closed open mold,
 - ii) adding the primer and then applying the topcoat to the primer and reacting in a closed or open mold,
 - iii) adding the primer and then applying the topcoat to the mold wall and reacting in a closed mold.

10. The process of Claim 9 which comprises introducing a carrier material to be coated into the mold by injection, knife coating, pouring or spraying prior to steps a) and b).

11. The process of Claim 9 which comprises introducing a carrier material into the mold by injection, knife coating, pouring or spraying after to steps a) and b).